

REMARKS

Claims 1-22 are pending in this application. Claims 1, 5, 8, 9, 11, 12, 15 and 18 have been amended. Claims 23-26 were withdrawn due to compliance with an earlier election requirement, and are now canceled.

Claims 1, 11 and 15 have been amended to recite the assembly wherein the first solid film is directly bonded to the outer surface of the fuel assembly. Several other changes have been proffered for further distinguishing the various components of the cryogenic fuel tank assembly. All of these amendments are supported by the specification (in particular paragraphs 0017-0020) and the drawings.

The applicant's invention is simple in its construction but as is well known extremely important when executed. It is directed to cryogenic fuel tank assemblies for aerospace vehicles characterized by improved bonding characteristics and improved resilience to on-orbit particle impact. The fuel tank assembly at its simplest includes a cryogenic fuel tank wall, a foam assembly affixed to the cryogenic fuel tank wall, the foam assembly having an inner surface and an outer surface, a first solid film is bonded to the outer surface to provide a uniform outer bonding surface; the thermal protection system for example, ceramic tiles, being bonded to the uniform outer bonding surface.

The Examiner has rejected claims 1, 2 and 6 as being anticipated by Schmidt (35 U.S.C. 102). The Examiner's position is that Schmidt teaches an aircraft thermal protection system which can be bonded to a cryogenic fuel tank wall... said assembly comprising a foam assembly (29), a solid film bonded to the outer surface of foam assembly (27) and a semi-rigid thermal protection system bonded to said foam assembly (25).

In response to the Examiner's position, applicants wish to incorporate by reference their remark as set forth in their amendment of April 21, 2006. Reference numeral 27 is not a solid film "bonded to said outer surface to provide a uniform outer bonding surface" as claimed by the present invention. Instead, part 27 is a strain isolation sheet extending inward of ceramic blocks. Part 27 is a pad formed from an elastomeric material for absorbing strain from thermal expansion which results from differences in the coefficients of thermal expansion between flexible outer skin and ceramic blocks. (column 3, lines 56-60). As an elastomeric pad capable of absorbing strains (through deformation), part 27 should not be construed as a solid film for presenting a uniform bonding surface as taught in the present invention. Contrary to what the Examiner has stated at page 2 of the office action of August 9, 2006, i.e., that part 27 of Schmidt is a solid film because as stated in the patent "part 27 is a pad formed from elastomeric material and is therefore made of a solid material as opposed to a gas or liquid." The Examiner comments that "any further limitation to the material should be added to the claim to be given patentable weight."

All of the claims recite that what is involved in applicants' claims is a film. The term "film" has an art accepted meaning, i.e., "a thin membranous skin...", "a thin flexible transparent sheet of plastic, adhesive, rubber or other material." So too does the term "pad" have an accepted meaning to the art, both terms appearing in standard dictionaries and never in an overlapping sense. See Ladedes, Daniel N., McGraw-Hill Dictionary of Scientific and Technical Terms, McGraw-Hill Book Company, New York (1974), pages 547 and 1066 (copy enclosed). Schmidt refers to part 27 as a "strain isolation sheet" defining it as "a pad formed from an elastomeric material for absorbing

strain... The drawings of Schmidt for example Figure 6, support that it is his intention to have a pad and not a membrane, see Figures 5 and 6 for example. Further the function of applicants' film is directed to improved bonding while that of the Schmidt pad is "absorbing and distributing strain which results from thermal expansion."

It is submitted that the rejection on Schmidt (35 U.S.C. 102) should be withdrawn.

The Examiner has rejected claims 3-5 and 7-22 as being unpatentable over Schmidt and in view of Middleton, (35 U.S.C. 103).

In formulating the rejections based on obviousness, the Examiner's position is that Schmidt teaches the invention as described above with respect to claims 1 and 2 and relies on Middleton to teach the use of a polyurethane layer (regarding claims 3, 4, 7 and 17), a honeycomb core (regarding claims 5, 11 and 18), a film layer bonded to inner surface of a foam layer (regarding claims 8, 13, 15 and 21), a fabric layer bonded to solid film layer (regarding claims 9, 10, 12, 14 and 15), a polyimide foam layer (claim 16), a silicon layer for bonding assembly together (regarding claim 19), and a second fabric layer bonded to the inside of foam layer (regarding claims 20 and 22).

The rejection is not believed justified and should be withdrawn.

As set forth above, it is the applicant's position that the Examiner's reading of Schmidt is not fair interpretation and that Schmidt does not teach the invention as claimed in claims 1 and 2.

Middleton, either considered alone or in combination with Schmidt, fails to teach the invention as claimed in claims 1 and 2.

Further, the Examiner's reliance on Middleton to teach the use of a polyurethane (foam) layer (31, 37) is based on an incorrect reading of Middleton. It is clearly indicated in Middleton (column 3, line 51 and line 55, and Table 1) that the polyurethane is present as an adhesive, rather than the insulating foam layer taught by the present invention. Middleton's teaching of polyurethane is therefore irrelevant to the present application.

In addition, the Examiner's reliance on Middleton to teach the use of a honeycomb core within the foam assembly (23) is also not justified as it is clearly indicated in Middleton (column 3, lines 48-50) that "the insulation assembly 21 includes a cellular insulating layer 23, such as a honeycomb core, having open cells 25 defined by cell walls 27." The honeycomb core taught by the present invention is not cellular and does not have open cells.

Therefore, the rejection to claims 3-5 and 7-10 (dependent on claim 1) should be withdrawn.

Similar to the arguments presented regarding claim 1, Schmidt and/or Middleton, fail to teach all the limitations as claimed in claims 11 and 15. Therefore, the rejection to claims 11-22 should be withdrawn.

The applicant respectfully requests the withdrawal of claim rejection due to obviousness over Schmidt in view of Middleton.

In view of the above, it is respectfully requested that the Examiner's rejections be withdrawn and the claims indicated as allowable to the applicant.

Respectfully Submitted,
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